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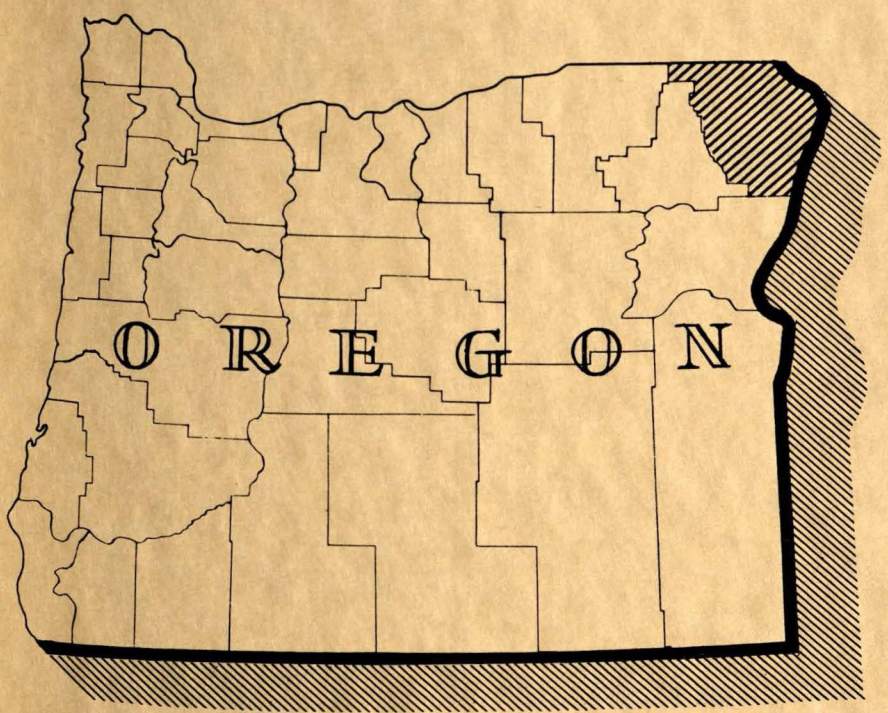
FOREST SURVEY REPORT 134
APRIL 1960

# FOREST STATISTICS *for* WALLOWA COUNTY, OREGON




PACIFIC NORTHWEST
FOREST AND RANGE EXPERIMENT STATION
U. S. DEPT. OF AGRICULTURE • FOREST SERVICE

PREPARED BY

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Forest Survey Report 134

# FOREST STATISTICS

# FOR

# WALLOWA COUNTY, OREGON

by

James T. Bones
and
Richard D. Schimel

April 1960

PACIFIC NORTHWEST
FOREST AND RANGE EXPERIMENT STATION
R. W. Cowlin, Director Portland, Oregon

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

# PREFACE

This publication summarizes the results of a 1957 reinventory of the forests of Wallowa County, Oreg. The reinventory is a part of the maintenance phase of the Forest Survey, a nationwide project of the Forest Service authorized by the McSweeney-McNary Forest Research Act of 1928, amended June 25, 1949. The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them to ascertain rates of forest growth and depletion, to estimate present consumption of timber products and determine probable future trends in timber requirements, to analyze and make available survey information needed in the formulation of forest policies and programs, and to make resurveys as necessary to keep the basic information up to date.

The Forest Survey is conducted in the various forest regions of the Nation by the regional experiment stations of the Forest Service. In the Pacific Northwest region of Oregon and Washington, it is an activity of the Pacific Northwest Forest and Range Experiment Station at Portland, Oreg.

The initial inventory of forest lands in Wallowa County took place in 1935 and 1936. A statistical report, "Forest Statistics for Wallowa County, Oregon," and a forest type map on a 1-inch-to-the-mile scale were released in 1937.

The forest type maps have been revised as a result of the 1957 reinventory and are available on scales of 1 and 2 inches to the mile. A single 1-inch-scale map was prepared for the county; 2-inch-scale maps were prepared in sections (see index map, inside rear cover). Prints of these maps are available at cost of blueprinting. For information write Director, Pacific Northwest Forest and Range Experiment Station, P. O. Box 4059, Portland 8, Oreg.

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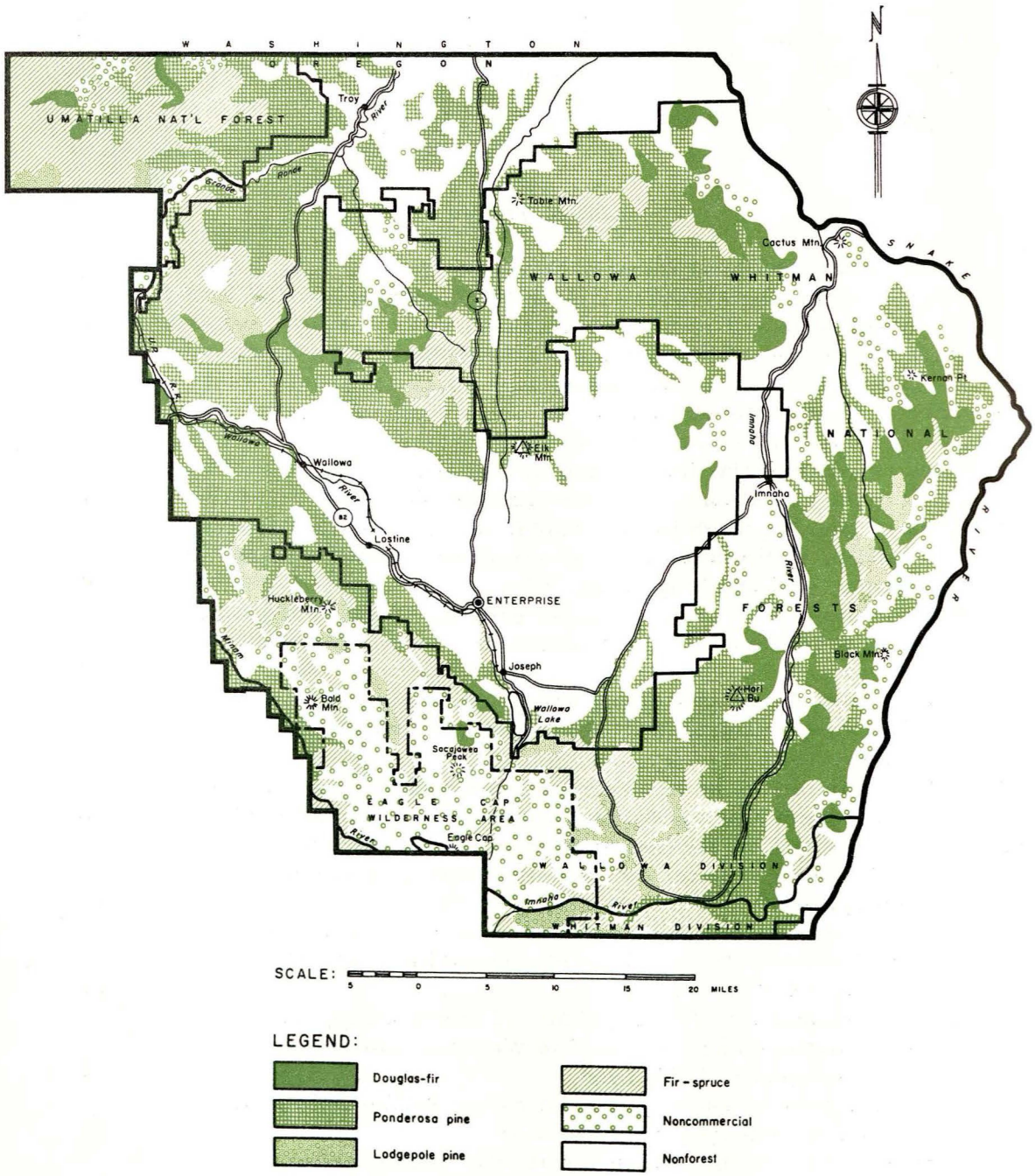
# GENERALIZED FOREST TYPE MAP

## WALLOWA COUNTY, OREGON

1957



## DESCRIPTION OF THE COUNTY

Wallowa County is located in the northeastern corner of the State of Oregon. It is bounded by the State of Washington on the north, the Snake River (Idaho boundary) on the east, Baker County on the south, and Union and Umatilla Counties on the west.

All of the county's major streams are tributaries of the Snake River. The Imnaha, Wallowa, and Minam Rivers head in the Wallowa Mountains, which form the county's southern boundary, and drain in a northerly direction. The Imnaha River empties directly into the Snake River while the Minam and Wallowa Rivers join the Grande Ronde River, which in turn empties into the Snake River.

The topography of Wallowa County is quite diverse. The Wallowa Valley, agricultural center of the county, is surrounded on all sides by prominent physical features. The granite peaks of the high Wallowas to the south and southwest and the abrupt river canyons of the north and east encircle the valley. The steep river gorges, which limit access for a 20-mile width on the eastern side of the county, are terminated by the 5,600-foot-deep Hells Canyon of the Snake River.

Elevations vary from 1,244 feet on the Snake River to 10,033 feet at the summit of the Sacajawea Peak in the Wallowa Mountains. The total annual precipitation varies with elevation. In 1957, the precipitation in Wallowa County varied from 12 inches in the Wallowa Valley to 50 inches in the mountains.

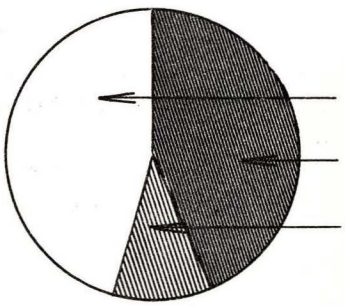
Wallowa County has no Federal highways traversing it but is served by State Highway 3 from the north and State Highway 82 from the west. A Forest Service road is proposed to link Wallowa County with Baker County on the south. A branch line of the Union Pacific Railroad connects the Wallowa Valley with the main line at La Grande to the west.

In recent years the population of Wallowa County has been steadily decreasing and shifting from the farms to the cities and villages. In 1958, the population was 6,750, a decrease of 7.1 percent from the number reported in the 1950 census. Of the 6,750 total population, 4,110 live in towns and 2,640 are rural dwellers. The town of Enterprise is the county seat.

## SIGNIFICANT FINDINGS IN THE FOREST INVENTORY

### Land Classification

About 1,101,000 acres or 55 percent of Wallowa County is forest land, 80 percent of which is classified as commercial. About two-thirds of the noncommercial forest land is unproductive and includes the high-elevation subalpine type and midelevation noncommercial rocky areas. The remaining one-third consists of productive-reserved land--commercial forest land reserved from cutting--[redacted]



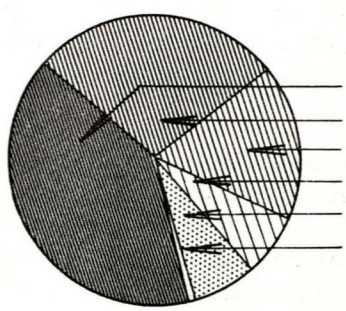
| Class | Percent |
|---|---|
| Nonforest | 45 |
| Commercial forest | 44 |
| Noncommercial forest | 11 |
| Total | 100 |

Forty-five percent of the total land area in Wallowa County is nonforest land. According to the 1954 Census of Agriculture, 37 percent of Wallowa County is farmland, which accounts for 82 percent of the total nonforest area. The remainder is barren cliff areas adjacent to the Snake River and in the Wallowa Mountains.

### Commercial Forest Land Area

#### Major Types

Although ponderosa pine is the predominant tree species throughout the county, it rarely appears in extensive pure stands; on northerly and easterly aspects Douglas-fir, western larch, and lodgepole pine become associates. The higher elevations are dominated by the fir-spruce type and by pure stands of lodgepole pine where fire consumed the original stand.

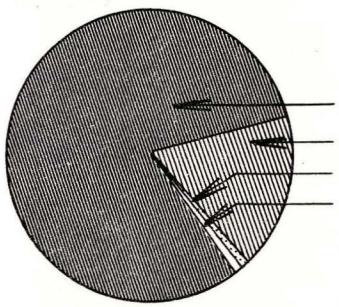


| Major type | Percent |
|---|---|
| Ponderosa pine | 40 |
| Douglas-fir | 28 |
| Fir-spruce | 17 |
| Western larch | 7 |
| Lodgepole pine | 7 |
| Other types | 1 |
| Total | 100 |

Other types include white pine at high elevations, hardwoods in the valley stream bottoms, and nonstocked areas.

## Stand-Size Classes

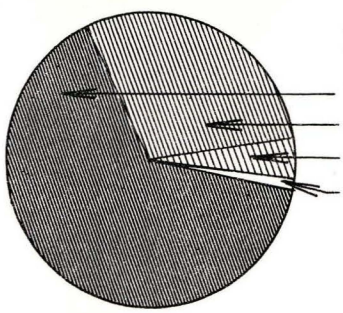
Nearly 47 percent of the total sawtimber stands are in trees that are predominately 21.0 inches d.b.h. or larger. Most of the poletimber stands have resulted from cutting in the lower elevations or fire in the higher ones. Commercial forest land acreage of seedling and sapling stands and nonstocked areas is negligible.



| Stand size | Percent |
|---|---|
| Sawtimber | 81 |
| Poletimber | 17 |
| Seedlings and saplings | 1 |
| Nonstocked | 1 |
| Total | 100 |

## Stocking of Young-Growth Stands

Most of the young-growth stands of Wallowa County are satisfactorily stocked (40-100 percent); only 6 percent are poorly stocked or nonstocked. (Young-growth stands are those in which the majority of the cubic-foot volume is in trees less than 21.0 inches d.b.h.) Sixty-nine percent of the young-growth sawtimber, 60 percent of the poletimber, and 38 percent of the seedling and sapling areas are well stocked (over 70 percent).



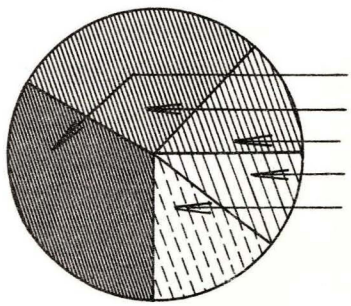
| Stocking class | Percent |
|---|---|
| Well | 65 |
| Medium | 29 |
| Poor | 5 |
| Nonstocked | 1 |
| Total | 100 |

## Commercial Forest Land Timber Volumes

The net volume of live sawtimber trees (11.0 inches d.b.h. and larger) on commercial forest land in Wallowa County is estimated to be 7,289 million board feet, Scribner rule. Ninety-eight percent is in sawtimber stands. The remaining volume is in sawtimber-size trees in poletimber, seedling and sapling, and nonstocked areas.

## Volume of Sawtimber by Species

Softwood species constitute more than 99 percent of the live sawtimber volume in Wallowa County. Sixty-two percent of this sawtimber volume is in ponderosa pine and Douglas-fir. The remaining volume is made up of several softwood and two hardwood species. "Other softwoods" include whitebark pine, lodgepole pine, subalpine fir, Engelmann spruce, and mountain hemlock; the hardwoods are black cottonwood and quaking aspen.

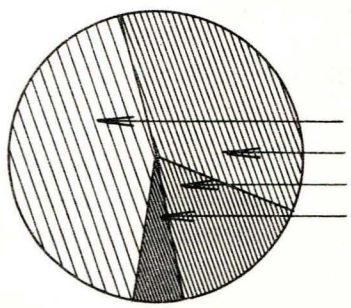


| Species | Percent |
|---|---|
| Ponderosa pine | 34 |
| Douglas-fir | 28 |
| White fir | 13 |
| Western larch | 11 |
| Other softwoods | 14 |
| Hardwoods | (1/) |
| Total | 100 |

1/ Less than 0.5 percent.

## Volume of Sawtimber by Diameter Classes

Of the two dominant species, 51 percent of the Douglas-fir and 78 percent of the ponderosa pine sawtimber volume is in trees more than 20.9 inches d.b.h.

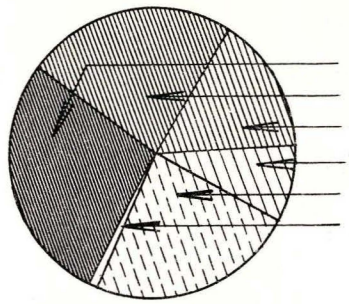


| Diameter class (Inches) | Percent |
|---|---|
| 11.0 - 20.9 | 42 |
| 21.0 - 30.9 | 36 |
| 31.0 - 40.9 | 17 |
| 41.0 and larger | 5 |
| Total | 100 |

## Volume of Growing Stock by Species

Growing-stock volume is the net cubic volume of all live sound trees 5.0 inches d.b.h. and larger to a minimum 4-inch top inside bark.

Of the total growing stock in Wallowa County, 78 percent is in sawtimber trees and 22 percent is in poletimber trees. Ponderosa pine and Douglas-fir comprise over half of the county's growing stock.

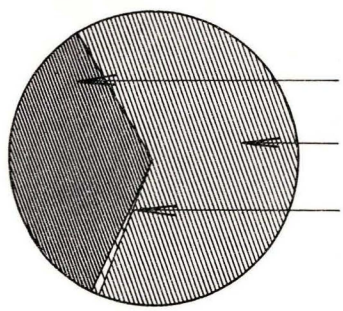


| Species | Percent |
|---|---|
| Ponderosa pine | 28 |
| Douglas-fir | 24 |
| White fir | 15 |
| Western larch | 9 |
| Other softwoods | 23 |
| Hardwoods | 1 |
| Total | 100 |

## Forest Ownership

### Commercial Forest Land

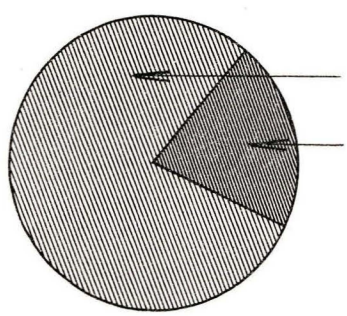
Nearly 66 percent of the commercial forest land in Wallowa County is federally owned, of which 99 percent is national forest. About 75 percent of the area of large sawtimber stands (trees more than 21.0 inches d.b.h.) and 58 percent of the area of small sawtimber stands (trees 11.0 to 20.9 inches d.b.h.) are on Federal lands. About 69 percent of the area of residual sawtimber stands is in private ownership.



| Ownership class | Percent |
|---|---|
| Private | 34 |
| Federal | 65 |
| Other public | 1 |
| Total | 100 |

### Sawtimber Volume

Approximately 79 percent of the live sawtimber volume in Wallowa County is found on Federal lands. Private owners have 21 percent of the total volume on 34 percent of the total sawtimber area.



| Ownership class | Percent |
|---|---|
| Federal | 79 |
| Private | 21 |
| Other public | (1/) |
| Total | 100 |

1/ Less than 0.5 percent.

## Log Production

Annual log production (Scribner rule) for Wallowa County during the period 1935-58 was reported to be:

| | Annual production[1/] (M b.m.) |
|---|---|
| 1935 | 16,205 |
| 1940 | 33,067 |
| 1945 | 34,480 |
| 1950 | 58,243 |
| 1955 | 79,906 |
| 1956 | 87,650 |
| 1957 | 99,635 |
| 1958 | 88,327 |

1/ Does not include volume removed for poles, piling, or products from woodcutting operations.

A peak log production in Wallowa County of 115 million board feet was reached in 1924, followed by a low of 6 million feet in 1934. Annual log production since 1934 has been generally increasing.

To date most of the logs have been supplied by private lands. In 1958, 65 percent of the total annual log production was provided by these lands that contain only 21 percent of the total sawtimber volume of the county. Indications are that as the need for logs increases and timber values rise, the timber-harvesting program on Federal lands in Wallowa County will accelerate.

Table 1.--Land area in Wallowa County, by major class of land, 1957

| Class of land | Area |
|---|---|
| | Acres |
| Forest: | |
| Commercial | 878,110 |
| Noncommercial: | |
| Productive-reserved | 70,440 |
| Unproductive | 152,770 |
| Total forest | 1,101,320 |
| Nonforest | 910,510 |
| All classes | 2,011,830 |

Table 2.--Area of commercial forest land in Wallowa County, by ownership and stand-size classes, 1957

(In acres)

| Ownership class | Total | Sawtimber stands | Poletimber stands | Seedling and sapling stands | Nonstocked areas |
|---|---|---|---|---|---|
| Private | 296,200 | 236,720 | 54,740 | 4,480 | 260 |
| State | 4,420 | 3,260 | 1,130 | 30 | -- |
| County | 270 | 270 | -- | -- | -- |
| Federal: | | | | | |
| Bureau of Land Mgt. | 4,690 | 4,430 | 220 | 40 | -- |
| National forest | 572,530 | 469,890 | 94,810 | 660 | 7,170 |
| Total Federal | 577,220 | 474,320 | 95,030 | 700 | 7,170 |
| All ownerships | 878,110 | 714,570 | 150,900 | 5,210 | 7,430 |

Table 3.--Area of commercial forest land in Wallowa County, by major forest type and stand-size class, 1957

(In acres)

| Forest type | Total | Sawtimber stands | | Poletimber stands | Seedling and sapling stands | Nonstocked areas |
|---|---|---|---|---|---|---|
| | | Large[1/] | Small[2/] | | | |
| Ponderosa pine | 348,710 | 193,400 | 103,830 | 48,470 | 3,010 | -- |
| White pine[3/] | 2,010 | 10 | 20 | 1,980 | -- | -- |
| Lodgepole pine | 58,680 | -- | 19,900 | 38,380 | 400 | -- |
| Douglas-fir | 246,410 | 82,240 | 122,900 | 40,770 | 500 | -- |
| Western larch | 60,310 | 22,280 | 32,870 | 4,600 | 560 | -- |
| Fir—spruce | 150,620 | 35,630 | 98,430 | 15,820 | 740 | -- |
| Hardwood | 3,940 | 840 | 2,220 | 880 | -- | -- |
| Nonstocked | 7,430 | -- | -- | -- | -- | 7,430 |
| Total | 878,110 | 334,400 | 380,170 | 150,900 | 5,210 | 7,430 |

[1/] 21.0 inches d.b.h. and larger.

[2/] 11.0-20.9 inches d.b.h.

[3/] The white pine cover type, as specified by the Forest Survey in the Pacific Northwest, may be Pinus monticola (western white pine), Pinus albicaulis (whitebark pine), or both.

Table 4.--Land area in Wallowa County, by cover

(In

| | Cover type or land class | Total unreserved and reserved |
|---|---|---|
| | | PRODUCTIVE |
| | | Total |
| 1 | Ponderosa pine, large sawtimber | 207,430 |
| 2 | Ponderosa pine, small sawtimber | 104,680 |
| 3 | Ponderosa pine, poletimber | 48,480 |
| 4 | Ponderosa pine, seedlings and saplings | 3,010 |
| 5 | White pine,[1/] large sawtimber | 10 |
| 6 | White pine, small sawtimber | 20 |
| 7 | White pine, poletimber | 1,980 |
| 8 | Lodgepole pine, small sawtimber | 19,960 |
| 9 | Lodgepole pine, poletimber | 43,730 |
| 10 | Lodgepole pine, seedlings and saplings | 980 |
| 11 | Douglas-fir, small old-growth and large young-growth sawtimber (red fir) | 92,070 |
| 12 | Douglas-fir, small sawtimber | 135,910 |
| 13 | Douglas-fir, poletimber | 44,750 |
| 14 | Douglas-fir, seedlings and saplings | 510 |
| 15 | Western larch, large sawtimber | 22,820 |
| 16 | Western larch, small sawtimber | 37,760 |
| 17 | Western larch, poletimber | 6,510 |
| 18 | Western larch, seedlings and saplings | 720 |
| 19 | White fir,[2/] large sawtimber | 27,770 |
| 20 | White fir, small sawtimber | 50,000 |
| 21 | White fir, poletimber | 6,130 |
| 22 | White fir, seedlings and saplings | 50 |
| 23 | True fir—mountain hemlock, large sawtimber | 1,950 |
| 24 | True fir—mountain hemlock, small sawtimber | 30,990 |
| 25 | True fir—mountain hemlock, poletimber | 12,030 |
| 26 | True fir—mountain hemlock, seedlings and saplings | 830 |
| 27 | Engelmann spruce, large sawtimber | 6,630 |
| 28 | Engelmann spruce, small sawtimber | 27,350 |
| 29 | Engelmann spruce, poletimber | 2,070 |
| 30 | Hardwoods, large sawtimber | 890 |
| 31 | Hardwoods, small sawtimber | 2,220 |
| 32 | Hardwoods, poletimber | 880 |
| 33 | Nonstocked area | 7,430 |
| 34 | Total | 948,550 |
| | | NONCOMMERCIAL |
| 35 | Subalpine | 54,050 |
| 36 | Noncommercial, rocky | 96,430 |
| 37 | Juniper | 2,290 |
| 38 | Total | 152,770 |
| | | NONFOREST |
| 39 | Vegetative land (cultivated, grass, or brush) | 735,320 |
| 40 | Nonvegetative land (including barrens and cities) | 172,320 |
| 41 | Unmeandered water | 2,870 |
| 42 | Total | 910,510 |
| | | ALL |
| | Forest land: | |
| 43 | Commercial | 878,110 |
| 44 | Noncommercial (productive-reserved and unproductive) | 223,210 |
| 45 | Total forest land | 1,101,320 |
| 46 | Nonforest land | 910,510 |
| 47 | Total all land | 2,011,830 |

[1/] The white pine cover type, as specified by the Forest Survey in the Pacific Northwest, may be Pinus monticola (western white pine), Pinus albicaulis (whitebark pine), or both.

[2/] See list of tree species, page 30.

type, ownership class, and land-use class, 1957

acres)

| Unreserved | | | | | | Reserved | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Federal | | | | | |
| Total | Private | State | County | Bureau of Land Mgt. | National forest | Total | State | Federal (national forest) | |
| **FOREST LAND** | | | | | | | | | |
| Commercial | | | | | | Noncommercial (productive-reserved) | | | |
| 193,400 | 58,610 | 810 | 80 | 2,490 | 131,410 | 14,030 | 140 | 13,890 | 1 |
| 103,830 | 75,650 | 1,870 | 30 | 720 | 25,560 | 850 | -- | 850 | 2 |
| 48,470 | 29,420 | 660 | -- | 50 | 18,340 | 10 | 10 | -- | 3 |
| 3,010 | 2,980 | 30 | -- | -- | -- | -- | -- | -- | 4 |
| 10 | 10 | -- | -- | -- | -- | -- | -- | -- | 5 |
| 20 | 20 | -- | -- | -- | -- | -- | -- | -- | 6 |
| 1,980 | -- | -- | -- | -- | 1,980 | -- | -- | -- | 7 |
| 19,900 | 300 | -- | -- | -- | 19,600 | 60 | -- | 60 | 8 |
| 38,380 | 10,700 | -- | -- | -- | 27,680 | 5,350 | -- | 5,350 | 9 |
| 400 | 400 | -- | -- | -- | -- | 580 | -- | 580 | 10 |
| 82,240 | 16,510 | 40 | 60 | 310 | 65,320 | 9,830 | 50 | 9,780 | 11 |
| 122,900 | 41,990 | 350 | 60 | 880 | 79,620 | 13,010 | -- | 13,010 | 12 |
| 40,770 | 10,790 | 470 | -- | 170 | 29,340 | 3,980 | 10 | 3,970 | 13 |
| 500 | 480 | -- | -- | 20 | -- | 10 | -- | 10 | 14 |
| 22,280 | 730 | -- | -- | -- | 21,550 | 540 | -- | 540 | 15 |
| 32,870 | 7,840 | 60 | 40 | 10 | 24,920 | 4,890 | -- | 4,890 | 16 |
| 4,600 | 2,000 | -- | -- | -- | 2,600 | 1,910 | -- | 1,910 | 17 |
| 560 | 540 | -- | -- | 20 | -- | 160 | -- | 160 | 18 |
| 27,160 | 4,550 | 70 | -- | -- | 22,540 | 610 | -- | 610 | 19 |
| 49,210 | 25,930 | 60 | -- | -- | 23,220 | 790 | -- | 790 | 20 |
| 6,060 | 980 | -- | -- | -- | 5,080 | 70 | -- | 70 | 21 |
| 50 | 50 | -- | -- | -- | -- | -- | -- | -- | 22 |
| 1,950 | -- | -- | -- | -- | 1,950 | -- | -- | -- | 23 |
| 25,930 | 400 | -- | -- | -- | 25,530 | 5,060 | -- | 5,060 | 24 |
| 7,690 | 530 | -- | -- | -- | 7,160 | 4,340 | -- | 4,340 | 25 |
| 690 | 30 | -- | -- | -- | 660 | 140 | -- | 140 | 26 |
| 6,520 | 100 | -- | -- | -- | 6,420 | 110 | -- | 110 | 27 |
| 23,290 | 1,700 | -- | -- | -- | 21,590 | 4,060 | -- | 4,060 | 28 |
| 2,070 | 90 | -- | -- | -- | 1,980 | -- | -- | -- | 29 |
| 840 | 840 | -- | -- | -- | -- | 50 | 50 | -- | 30 |
| 2,220 | 1,540 | -- | -- | 20 | 660 | -- | -- | -- | 31 |
| 880 | 230 | -- | -- | -- | 650 | -- | -- | -- | 32 |
| 7,430 | 260 | -- | -- | -- | 7,170 | -- | -- | -- | 33 |
| 878,110 | 296,200 | 4,420 | 270 | 4,690 | 572,530 | 70,440 | 260 | 70,180 | 34 |
| **UNPRODUCTIVE FOREST LAND** | | | | | | | | | |
| 5,180 | 1,230 | -- | -- | -- | 3,950 | 48,870 | -- | 48,870 | 35 |
| 50,770 | 6,250 | 200 | 80 | 1,310 | 42,930 | 45,660 | -- | 45,660 | 36 |
| 2,290 | 310 | -- | -- | -- | 1,980 | -- | -- | -- | 37 |
| 58,240 | 7,790 | 200 | 80 | 1,310 | 48,860 | 94,530 | -- | 94,530 | 38 |
| **LAND** | | | | | | | | | |
| 660,670 | 509,890 | 4,000 | 50 | 8,760 | 137,970 | 74,650 | 60 | 74,590 | 39 |
| 61,790 | 39,890 | 1,060 | -- | 5,370 | 15,470 | 110,530 | 40 | 110,490 | 40 |
| 2,210 | 740 | 50 | -- | 130 | 1,290 | 660 | -- | 660 | 41 |
| 724,670 | 550,520 | 5,110 | 50 | 14,260 | 154,730 | 185,840 | 100 | 185,740 | 42 |
| **LAND** | | | | | | | | | |
| 878,110 | 296,200 | 4,420 | 270 | 4,690 | 572,530 | -- | -- | -- | 43 |
| 58,240 | 7,790 | 200 | 80 | 1,310 | 48,860 | 164,970 | 260 | 164,710 | 44 |
| 936,350 | 303,990 | 4,620 | 350 | 6,000 | 621,390 | 164,970 | 260 | 164,710 | 45 |
| 724,670 | 550,520 | 5,110 | 50 | 14,260 | 154,730 | 185,840 | 100 | 185,740 | 46 |
| 1,661,020 | 854,510 | 9,730 | 400 | 20,260 | 776,120 | 350,810 | 360 | 350,450 | 47 |

Table 5.--Area of commercial forest land in Wallowa County, by forest-condition and ownership classes, 1957

(In acres)

| Forest-condition class | Total | Private | State | County | Federal | |
|---|---|---|---|---|---|---|
| | | | | | Bureau of Land Mgt. | National forest |
| Softwoods: | | | | | | |
| Large sawtimber: | | | | | | |
| Uncut | 279,650 | 57,550 | 560 | 130 | 2,430 | 218,980 |
| Residual | 53,910 | 22,960 | 360 | 10 | 370 | 30,210 |
| Total | 333,560 | 80,510 | 920 | 140 | 2,800 | 249,190 |
| Small sawtimber: | | | | | | |
| Uncut | 251,380 | 52,760 | 510 | 100 | 1,000 | 197,010 |
| Residual | 126,570 | 101,070 | 1,830 | 30 | 610 | 23,030 |
| Total | 377,950 | 153,830 | 2,340 | 130 | 1,610 | 220,040 |
| Poletimber | 150,020 | 54,510 | 1,130 | -- | 220 | 94,160 |
| Seedlings and saplings | 5,210 | 4,480 | 30 | -- | 40 | 660 |
| Hardwoods | 3,940 | 2,610 | -- | -- | 20 | 1,310 |
| Nonstocked | 7,430 | 260 | -- | -- | -- | 7,170 |
| Total | 878,110 | 296,200 | 4,420 | 270 | 4,690 | 572,530 |

Table 6.--Area of young-growth timber stands on commercial forest land in Wallowa County, by stand-size class, species group, and stocking class, 1957[1/]

(In acres)

| Stand-size class and species group | Total | Well stocked | Medium stocked | Poorly stocked |
|---|---|---|---|---|
| Young-growth sawtimber: | | | | |
| Softwoods | 377,950 | 260,340 | 105,990 | 11,620 |
| Hardwoods | 2,220 | 1,420 | 730 | 70 |
| Total | 380,170 | 261,760 | 106,720 | 11,690 |
| Poletimber: | | | | |
| Softwoods | 150,020 | 88,960 | 46,680 | 14,380 |
| Hardwoods | 880 | 840 | 40 | -- |
| Total | 150,900 | 89,800 | 46,720 | 14,380 |
| Seedlings and saplings: | | | | |
| Softwoods | 5,210 | 1,960 | 2,030 | 1,220 |
| Hardwoods | -- | -- | -- | -- |
| Total | 5,210 | 1,960 | 2,030 | 1,220 |
| All classes: | | | | |
| Softwoods | 533,180 | 351,260 | 154,700 | 27,220 |
| Hardwoods | 3,100 | 2,260 | 770 | 70 |
| Total | 536,280 | 353,520 | 155,470 | 27,290 |

1/ Young-growth stands are those in which the majority of the cubic-foot volume is in trees less than 21.0 inches d.b.h.

Table 7.--Net volume of live sawtimber and growing stock on commercial forest land in Wallowa County, by ownership class, 1957

| Ownership class | Live sawtimber volume | | Growing stock volume |
|---|---|---|---|
| | Scribner rule | International 1/4-inch rule | |
| | Million bd.ft. | Million bd.ft. | Million cu.ft. |
| Private | 1,488 | 1,664 | 399 |
| State | 19 | 21 | 5 |
| County | 2 | 2 | (1/) |
| Federal: | | | |
| Bureau of Land Mgt. | 25 | 28 | 6 |
| National forest | 5,755 | 6,322 | 1,393 |
| Total Federal | 5,780 | 6,350 | 1,399 |
| All ownerships | 7,289 | 8,037 | 1,803 |

1/ Less than 0.5 million.

Table 8.--Net volume of live sawtimber and growing stock on commercial forest land in Wallowa County, by stand-size class, 1957

| Stand-size class | Live sawtimber volume | | Growing stock volume |
|---|---|---|---|
| | Scribner rule | International 1/4-inch rule | |
| | Million bd.ft. | Million bd.ft. | Million cu.ft. |
| Sawtimber stands | 7,161 | 7,893 | 1,694 |
| Poletimber stands | 123 | 138 | 108 |
| Seedling and sapling stands | 1 | 1 | (1/) |
| Nonstocked areas | 4 | 5 | 1 |
| Total | 7,289 | 8,037 | 1,803 |

1/ Less than 0.5 million.

Table 9.--Net volume of live sawtimber and growing stock on commercial forest land in Wallowa County, by species, 1957

| Species | Live sawtimber volume | | Growing stock volume |
|---|---|---|---|
| | Scribner rule | International 1/4-inch rule | |
| | Million bd.ft. | Million bd.ft. | Million cu.ft. |
| Softwoods: | | | |
| Ponderosa pine | 2,476 | 2,695 | 500 |
| Douglas-fir | 2,058 | 2,295 | 437 |
| White fir | 920 | 994 | 276 |
| Western larch | 788 | 873 | 159 |
| Engelmann spruce | 482 | 544 | 142 |
| Lodgepole pine | 256 | 300 | 164 |
| Subalpine fir | 254 | 274 | 101 |
| Mountain hemlock | 17 | 18 | 4 |
| Whitebark pine | 5 | 6 | 2 |
| Total | 7,256 | 7,999 | 1,785 |
| Hardwoods: | | | |
| Black cottonwood | 33 | 38 | 10 |
| Quaking aspen | (1/) | (1/) | 2 |
| Red alder | -- | -- | 3 |
| Northwestern paper birch | -- | -- | 3 |
| Total | 33 | 38 | 18 |
| Total all species | 7,289 | 8,037 | 1,803 |

1/ Less than 0.5 million.

Table 10.--Net volume of live sawtimber on commercial forest land in Wallowa County, by diameter class and species group, 1957

(In million board feet)

| Diameter class (inches d.b.h.) and log rule | Total | Ponderosa pine | Douglas-fir | White fir | Western larch | Other soft-woods | Hard-woods |
|---|---|---|---|---|---|---|---|
| 11.0-20.9: | | | | | | | |
| Scribner rule | 3,082 | 538 | 1,010 | 430 | 319 | 782 | 3 |
| International 1/4-inch rule | 3,524 | 624 | 1,171 | 464 | 370 | 892 | 3 |
| 21.0-30.9: | | | | | | | |
| Scribner rule | 2,641 | 1,017 | 720 | 340 | 340 | 195 | 29 |
| International 1/4-inch rule | 2,855 | 1,098 | 777 | 368 | 367 | 211 | 34 |
| 31.0-40.9: | | | | | | | |
| Scribner rule | 1,209 | 736 | 247 | 93 | 103 | 30 | -- |
| International 1/4-inch rule | 1,284 | 781 | 262 | 101 | 109 | 31 | -- |
| 41.0 and larger: | | | | | | | |
| Scribner rule | 357 | 185 | 81 | 57 | 26 | 7 | 1 |
| International 1/4-inch rule | 374 | 192 | 85 | 61 | 27 | 8 | 1 |
| All diameter classes: | | | | | | | |
| Scribner rule | 7,289 | 2,476 | 2,058 | 920 | 788 | 1,014 | 33 |
| International 1/4-inch rule | 8,037 | 2,695 | 2,295 | 994 | 873 | 1,142 | 38 |

Table 11.--Net volume of all timber on commercial forest land in Wallowa County, by class of material and species group, 1957

(In million cubic feet)

| Class of material | Total | Softwoods | Hardwoods |
|---|---|---|---|
| Growing stock: | | | |
| Sawtimber trees: | | | |
| Saw-log portion | 1,303 | 1,296 | 7 |
| Upper-stem portion | 99 | 98 | 1 |
| Total | 1,402 | 1,394 | 8 |
| Poletimber trees | 401 | 391 | 10 |
| Total growing stock | 1,803 | 1,785 | 18 |
| Other material: | | | |
| Sound cull trees | 7 | 6 | 1 |
| Rotten cull trees | 6 | 6 | (1/) |
| Salvable dead trees | 14 | 14 | -- |
| Total other material | 27 | 26 | 1 |
| All timber | 1,830 | 1,811 | 19 |

1/ Less than 0.5 million.

Table 12.--Average annual cut of live sawtimber and growing stock on commercial forest land in Wallowa County, by species group, 1953-58

| Species group[1] | Live sawtimber | | | | | | Growing stock | | |
|---|---|---|---|---|---|---|---|---|---|
| | Scribner rule | | | International 1/4-inch rule | | | | | |
| | Annual cut[2] | Timber products | Logging residue | Annual cut[2] | Timber products | Logging residue | Annual cut[2] | Timber products | Logging residue |
| | Thousand board feet | | | Thousand board feet | | | Thousand cubic feet | | |
| Softwoods | 90,162 | 92,759 | 1,818 | 99,414 | 102,278 | 2,005 | 24,276 | 22,945 | 1,331 |

[1] Hardwood cut insignificant.

[2] Annual cut is the reduction in inventory volume resulting from the production of the given output of timber products.

## FOREST SURVEY PROCEDURE

Procedures used in the reinventory of Wallowa County were materially different from those used in the initial inventory. This change in procedures accounts for some significant differences in the forest-area and timber-volume statistics obtained.

### Initial Inventory

The initial inventory of the county's forests was conducted in 1935 and 1936 by what is known as the "compilation method." In this method, existing information on forest types, timber volumes, areas logged, and other inventory data were collected from private timber owners and various public agencies. These data were checked in the field for reliability and were adjusted to Forest Survey specifications and standards. Forest-type and timber-volume data for areas not covered by reliable existing information were obtained through field reconnaissance.

All land in the county was classified as either forest or nonforest. Forest land was further classified as commercial or noncommercial; the commercial was still further classified by forest type, stand-size or condition class, and--in the case of young-growth stands--by stocking and age classes. All such types and classes were mapped in place on a 1-inch-to-the-mile base map of each forested township. These township type maps were then superimposed over current ownership-status plats and dot counted to obtain forest-type area statistics by ownership class. Type delineations on the township maps were traced to a base map of the county to form a county forest type map. The commercial forest land was also classified as to site quality, or forest productive capacity.

In-place, timber-volume estimates were based on existing cruises collected and adjusted to the Forest Survey standard, on field samples, and on ocular appraisals. Cruises made by commercial cruisers were obtained for most of the privately owned timber and Forest Service cruises were available for a large part of the national-forest lands. Separate volume estimates were computed for each of the commercial tree species and for each ownership class. Methods used in this initial inventory did not permit a statistical computation of accuracy of the estimate.

### Reinventory

In the 1957 reinventory, the forest type map of the county was completely revised. This revision was accomplished through interpretation, classification, and field mapping on aerial photos that covered all of the forest land in the county. In the mapping on aerial photos, types whose classification was difficult were examined more closely in the field. Likewise, species composition of mixed stands was checked on the ground. The use of aerial photos in mapping resulted in type delineations of much greater

accuracy and detail than were possible through the ground reconnaissance employed in the initial inventory. In the preparation of a revised type map, the delineations on the aerial photos were transferred to a 2-inch county base map through use of a reflecting projector.

Forest type areas were obtained by two methods. In the first method area figures were derived by superimposing the type map over a current ownership-status map and dot counting. This was done for the Pine and Union Working Circles of the Wallowa-Whitman National Forests and the "all other ownership" stratum, which included private, county, and State lands.

The second method, based on a systematic grid of plots, was used to determine area figures for the Wenaha Working Circle and Wenaha Land Management Unit of the Umatilla National Forest and the Wallowa Working Circle of the Wallowa-Whitman National Forests. Each of the three subplots in every plot cluster was first classified as commercial forest, noncommercial forest, or nonforest. The ratio of subplots in each class to the total number of subplots was applied to the total land area to determine the acreage of each classification. Subplots falling on commercial forest land were also classified by forest type and stand-size class as indicated by the subplot tally. The percentage of subplots falling in each type was applied to the total area of commercial forest land in the working circle to determine the acreage of land in that type.

Volume estimates for live sawtimber, growing stock, and salvable dead material for the Pine and Union Working Circles and "all other ownership" stratum were calculated by applying average per-acre volumes to the appropriate forest type acreages. The average per-acre volumes for sawtimber stands and poletimber stands were obtained through a grid sampling procedure in which the stands were measured at a 1.7-mile or 3.4-mile interval, varying with accuracy requirements for different strata. Intensity of sampling was designed to produce a total volume estimate in the county to a specified sampling accuracy set by Forest Survey. The sample plots consisted of clusters of three 1/5-acre circular plots spaced at 6-chain intervals.

Average per-acre volumes of sawtimber and poletimber trees in the overstory of seedling and sapling stands and on nonstocked areas were obtained through an aerial-photo plot-sampling procedure for the Pine and Union Working Circles and "all other ownership" stratum. First, 1-acre photo plots were located through random selection. Next, estimates were made of average number of trees per acre, average crown diameter, and average total height for both sawtimber- and poletimber-size trees. Finally, gross volume of the average tree in each class was obtained from volume tables and then adjusted for defect and breakage to obtain net volume.

In the Wallowa and Wenaha Working Circles and the Wenaha Land Management Unit, volume estimates for all size classes were determined

by species for all subplots falling on commercial forest land. Average per-acre volumes for commercial forest land plots were then expanded by the total acreage of commercial forest land, providing total volume by species for each working circle inventoried.

## ACCURACY OF 1957 REINVENTORY DATA

### Forest Area

The in-place mapping of the forests and their classification by forest type, stand-size class, and condition class were based on 100-percent coverage for the Pine and Union Working Circles and "all other ownership" stratum. Thus no error due to sampling was involved. Errors due to techniques or judgment in the field and in office computation of data were possible, but difficult to evaluate. Throughout all phases of the work, however, close supervision and frequent checks assured a high level of accuracy and uniformity of standards.

The Wallowa and Wenaha Working Circles and Wenaha Land Management Unit were sampled for area, consequently an accuracy figure could be calculated. The chances are 19 out of 20 that the actual total area of commercial forest land in the Wallowa County portions of the three above-mentioned strata is within plus or minus 4.7 percent of the estimated total of 565,001 acres, and that the noncommercial unproductive area is within plus or minus 31.8 percent of the estimated total of 48,169 acres.

### Timber Volume

The chances are 19 out of 20 that the total board-foot volume of live sawtimber, if measured by a 100-percent cruise, would be within plus or minus 8.73 percent of the estimated total of 7,289 million board feet, Scribner rule. On the same basis, cubic-foot volume of growing stock from a 100-percent cruise would be within a range of plus or minus 7.43 percent of the estimated 1,803 million cubic feet. Volume estimates by species, stand-size class, or other subdivision probably have greater sampling errors.

## DIFFERENCES IN RESULTS OF INVENTORIES

Some of the differences between forest-type and timber-volume statistics resulting from the initial inventory and the reinventory are due to physical change--such as cutting of stands, restocking of deforested areas, and ingrowth of stands into the next larger size class. Other differences are due to variations in the procedures used to interpret and classify forest conditions, and to variations in standards of utilization. Differences such as these preclude direct comparison of some of the statistics; comparison of other statistics is meaningful only after they have been adjusted to common standards.

## Forest Area

The total area of forest land has decreased slightly between inventories. Clearing forest land for agriculture and differences in inventory techniques are two possible reasons for the change.

The 1957 reinventory showed a decrease in poletimber, seedling and sapling, and noncommercial areas. This was about compensated for by an increase in the area of sawtimber. Some of this change may be due to growth and less intensive cutting; part is attributable to differing utilization standards and the inventory techniques used.

Table 13.--Comparison of forest area statistics for Wallowa County, initial inventory and reinventory

(Thousand acres)

| Forest area | 1935-36 | 1957 |
|---|---|---|
| Sawtimber | 635 | 715 |
| Poletimber; seedlings and saplings | 215 | 156 |
| Nonstocked | 7 | 7 |
| Noncommercial (productive-reserved and unproductive) | 253 | 223 |
| Total | 1,110 | 1,101 |

## Timber Volume

The reinventory showed a greater volume of sawtimber for all species than did the initial inventory. Some of this difference may be due to a favorable growth-drain relationship, where the gain in volume through ingrowth of poletimber trees and growth of sawtimber trees is greater than the loss in volume through cutting or destruction by fire, insects, windthrow, or disease. However, it appears likely that most of the difference is due to changes in standards of utilization and in Forest Survey procedures.

Table 14.--Comparison of timber volume statistics for Wallowa County, initial inventory and reinventory

(Million board feet, Scribner rule)

| Species | 1935-36 | 1957 |
|---|---|---|
| Ponderosa pine | 2,243 | 2,476 |
| Douglas-fir | 968 | 2,058 |
| Western larch | 509 | 788 |
| White fir | 331 | 920 |
| Other softwoods | 175 | 1,014 |
| Hardwoods | 3 | 33 |
| Total | 4,229 | 7,289 |

The reinventory showed an increase in sawtimber volume for all species, but the proportionate increase in ponderosa pine was slight in comparison with all others. This is due primarily to two reasons: (1) more of the high-elevation country was included as commercial forest land and (2) more conservative cull estimates were given these minor species because of increasing recognition of their value.

## DEFINITION OF TERMS

### Land Area

#### Total Land Area

Includes dry land and unmeandered water surfaces.

#### Forest Land Area

Includes (a) land that is at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; and (b) land from which the trees described in "(a)" have been removed to less than 10-percent stocking and that has not been developed for other use. Minimum area of forest land recognized in reinventory of the county is 10 acres.

#### Nonforest Land Area

Land that does not qualify as forest land. Minimum area recognized in the reinventory of the county is 10 acres.

## Forest Land Classes

### Commercial Forest Land Area

Forest land that is (a) producing, or is physically capable of producing, usable crops of wood, (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

### Noncommercial Forest Land Area

Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but that otherwise qualifies as commercial forest land, or (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

## Types

### Forest Land Types

Forest land is typed on the basis of the predominant species, as indicated by cubic volume for sawtimber and poletimber stands and number of trees for seedling and sapling stands, or on the basis of forest condition, such as nonstocked cutover or burned-over land. Where none of the indicated species comprise 50 percent or more of a given stand, the stand is classified on the basis of plurality of cubic volume or number of trees. In classifying forest land by type, the minimum area recognized is 10 acres.

#### Commercial Forest Land

Major forest types. Local forest types are grouped into generalized types. The major forest types in Wallowa County are as follows:

Ponderosa pine. Forests in which 50 percent or more of the stand is ponderosa pine.

Lodgepole pine. Forests in which 50 percent or more of the stand is lodgepole pine.

Douglas-fir. Forests in which 50 percent or more of the stand is Douglas-fir.

Western larch. Forests in which 50 percent or more of the stand is western larch.

Fir-spruce. Forests in which 50 percent or more of the stand is true fir, Engelmann spruce, or both.

Hardwoods. Forests in which 50 percent or more of the stand is black cottonwood or other hardwoods, singly or in combination.

Noncommercial Forest Land

Productive-reserved. Forest land withdrawn from timber utilization through statute, ordinance, or administrative order, but that otherwise qualifies as commercial forest land.

Unproductive. Forest land incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Nonforest Land Types

Vegetative. Cultivated land, stump pasture, grass, or brush on nonforest land.

Nonvegetative. Includes barrens and towns.

Unmeandered water. Includes unmeandered streams and lakes, and tideflats.

## Tree Classes

Sawtimber Tree

Tree of commercial species, 11.0 inches d.b.h. and larger, that contains at least one 16-foot coniferous saw log or one 8-foot hardwood saw log to a variable top diameter never less than 8 inches inside the bark. Also, 25 percent or more of the gross board-foot volume must be free from rot or defect.

Poletimber Tree

Tree of commercial species, 5.0 to 10.9 inches d.b.h., in which 25 percent or more of the gross cubic-foot volume is free from rot and defect.

Seedling and Sapling Trees

Live trees of commercial species, less than 5.0 inches d.b.h., and of good form and vigor.

Cull Tree

Live tree of sawtimber or poletimber size that is unmerchantable for saw logs, now or prospectively, because of defect, rot, or species.

Sound cull tree. Live tree of sawtimber or poletimber size that contains 25 percent or more of sound volume but will not make at least one merchantable saw log, now or prospectively, because of roughness, poor form, or species.

Rotten cull tree. Live tree of sawtimber or poletimber size in which less than 25 percent of the total volume is sound.

Salvable Dead Tree

Standing or down dead tree that contains 25 percent or more of sound volume and at least one merchantable 16-foot coniferous or 8-foot hardwood saw log.

## Stand-Size Classes

Sawtimber Stand

Stand of sawtimber trees having a minimum per-acre net volume of 1,500 board feet (International 1/4-inch rule).

Large sawtimber stand. Stand in which the majority of the volume is in trees 21.0 inches d.b.h. and larger.

Small sawtimber stand. Stand in which the majority of the volume is in trees from 11.0 to 20.9 inches d.b.h.

Uncut sawtimber stand. Uncut sawtimber stand or sawtimber stand in which less than 10 percent of its volume has been removed by cutting.

Residual sawtimber stand. Sawtimber stand in which 10 percent or more of the volume has been removed by cutting, and in which the residual per-acre volume amounts to 1,500 board feet (International 1/4-inch rule).

Poletimber Stand

Stand failing to meet sawtimber stand specifications but at least 10 percent stocked with poletimber and larger (5.0 inches d.b.h. and larger) trees and with at least half the minimum stocking in poletimber trees.

Seedling and Sapling Stand

Stand not qualifying as either a sawtimber or poletimber stand but at least 10 percent stocked with trees of commercial species and with at least half the minimum stocking in seedling and sapling trees.

Nonstocked Area

An area less than 10 percent stocked with present or potential growing-stock trees.

## Stocking

Stocking is the extent to which growing space is effectively utilized by present or potential growing-stock trees of commercial species. "Degree of stocking" is synonymous with "percentage of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Stocking may be measured in terms of number of trees, volume, basal area, cover canopy, or other criterion or combination of criteria.

Well-stocked stand. Stand that is 70 percent or more stocked with present or potential growing-stock trees.

Medium-stocked stand. Stand that is 40 to 69 percent stocked with present or potential growing-stock trees.

Poorly stocked stand. Stand that is 10 to 39 percent stocked with present or potential growing-stock trees.

Nonstocked area. An area less than 10 percent stocked with present or potential growing-stock trees.

## Timber Volume

Live Sawtimber Volume

Net volume in board feet of live sawtimber trees of commercial species:

Scribner rule. The common board-foot log rule used in determining volume of sawtimber in the Pacific Northwest.

International 1/4-inch rule. The standard board-foot log rule adopted nationally by the Forest Service in the presentation of Forest Survey volume statistics.

Growing Stock

Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

All-Timber Volume

Net volume in cubic feet of live and salvable dead sawtimber trees and poletimber trees of commercial species, and cull trees of all species from stump to a minimum 4.0-inch top inside bark.

## Timber Cut

Annual Cut of Live Sawtimber

The net board-foot volume of live sawtimber trees cut or killed by logging on commercial forest land during a specified year.

Timber products from live sawtimber. The volume of timber products cut from live sawtimber.

Logging residues from live sawtimber. The volume of sound wood in live sawtimber trees cut or killed by logging on commercial forest land and not converted to timber products.

Annual Cut of Growing Stock

The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging on commercial forest land during a specified year.

Timber products from growing stock. The volume of timber products cut from growing stock.

Logging residues from growing stock. The volume of sound wood in growing stock cut or killed by logging on commercial forest land and not converted to timber products.

## TREE SPECIES

Tree species commonly found in Wallowa County include:

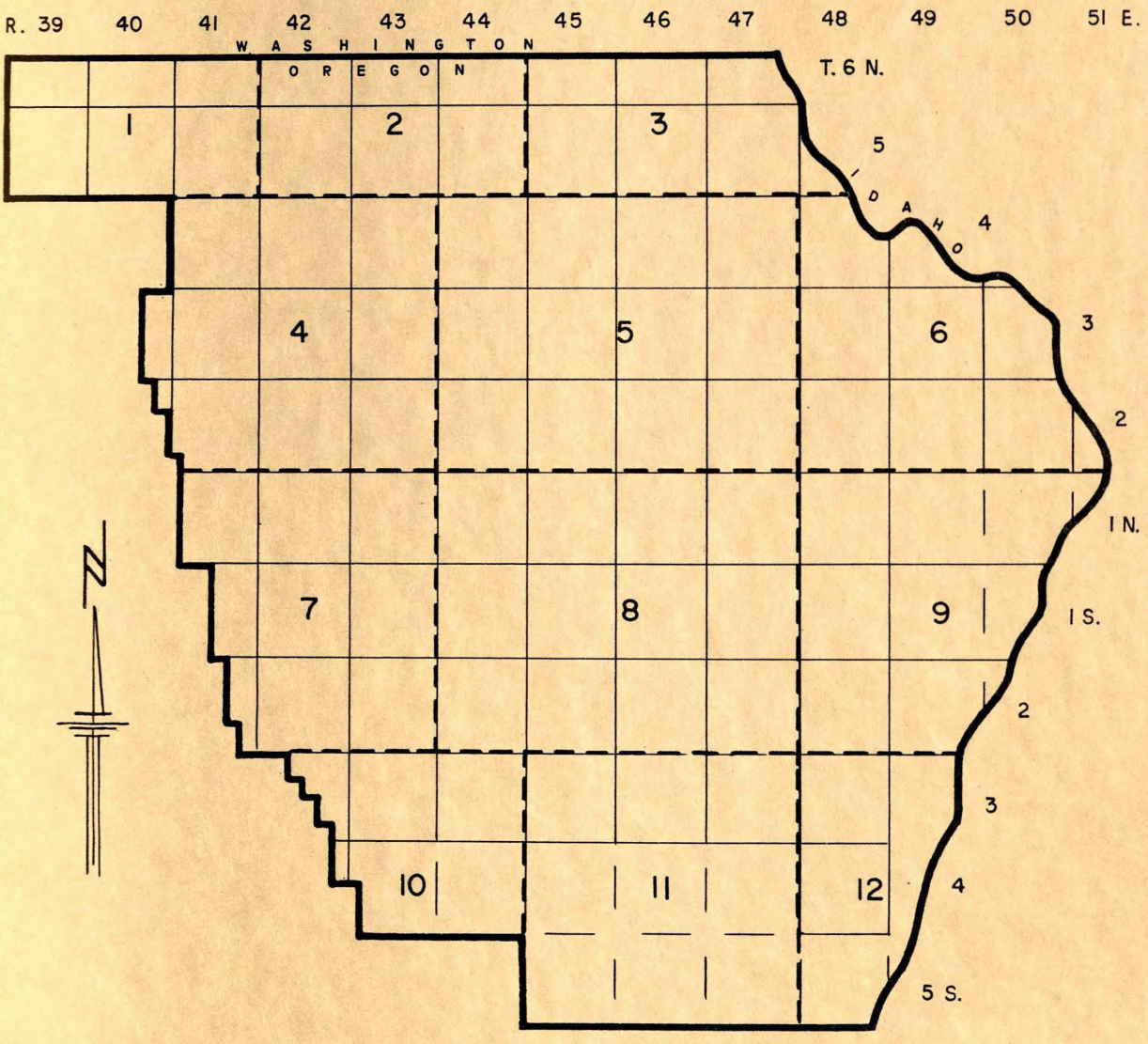
Softwoods:

- Ponderosa pine (*Pinus ponderosa*)
- Whitebark pine (*Pinus albicaulis*)
- Lodgepole pine (*Pinus contorta*)
- Douglas-fir (*Pseudotsuga menziesii*)
- Western larch (*Larix occidentalis*)
- White fir (*Abies concolor* or *A. grandis*)[1/]
- Subalpine fir (*Abies lasiocarpa*)
- Engelmann spruce (*Picea engelmannii*)
- Mountain hemlock (*Tsuga mertensiana*)

Hardwoods:

- Red alder (*Alnus rubra*)
- Black cottonwood (*Populus trichocarpa*)
- Quaking aspen (*Populus tremuloides*)
- Northwestern paper birch (*Betula papyrifera* var. *subcordata*)

[1/] No attempt was made to separate *A. concolor* (white fir) from *A. grandis* (grand fir). White fir, as specified in the Forest Survey in the Pacific Northwest, may be *concolor*, *grandis*, or both.




INDEX MAP of

WALLOWA CO.

STATE of OREGON

showing divisions of 2" = 1 mile maps